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YOGA THERAPY FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASES

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Sl.No.	CONTENTS	Page No.
1	Introduction	1
2	Concept of Health	4
3	Description of COPD	4
4	Yogic Management	5
5	Review of Literature	6
6	Materials and Methods	7
7	Observations and Results	9
8	Discussion	11
9	Conclusion	12
10	References	13

YOGA THERAPY FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASES

Chapter 1

Introduction

An introduction is very much necessary for any thesis or article. This covers the preamble and objective of the respective topic. This forms the first chapter of the thesis. In this context introduction to the subject of yoga, a preliminary measures of the chosen topic and relevance in the current era is briefed. Summarized part of it is as follows.

Yoga is a precious gift to mankind from the great sages of India. It is the spiritual and scientific discipline to know one's own nature. Evidences of yoga can be seen in ancient literatures of India like *Vedas, Upanisads, Smrtis, Epics* and *Purānas*. But a very systematic approach is not available before the period of Maharshi Patanjali. He is the one who has contributed to the field of yoga by his yogasutras. Later yoga has developed as a philosophy for years to come. Similarly the other Indian philosophies were also advanced. The aim of all the Indian philosophies is to overcome from afflictions of life. As we see, in the current era health hazards are the major cause for the sorrow. In order to overcome from health related issues, yoga is very much beneficial. By understanding the Yoga S*ū*tras of *Patañjali* thoroughly one can realize that body and mind are interrelated. Hence various physical practices like asanas and pranayamas are explained prior to the higher practices. All these, as claimed by the sutras themselves, aim at bringing about integration in the psycho-physiological process as a first step towards the attainment of Samadhi.[1] Any waste material which the body generates must be removed from the body. If not, it may stagnate at various parts of the body and may

cause for the development of various diseases. Here one can think of Yogic techniques which can eliminate these impurities from the body. '*yogāngānustānādaśuddhikşaye jñānadīptirāvivekakhyāteh*' says *Pātañjala Yogasūtra*.[2]

Yoga works on all aspects of the person: the physical, mental, emotional, psychic and spiritual. Study of yoga leads naturally to modification of thoughts and behaviour and a new realization of the purposes and processes of life. This holistic approach leads to better health and eradication of physical and mental disorders. Yoga is an effective and time tested method for curing and promoting our health, as well as, prevention and management of acute and chronic disorders.

Health is the greatest asset in human life and one should cherish it with utmost care, let he may succumb to disease Every human society, be it rural or urban, industrial or technologically advanced, is affected extremely by pollution of the air. Atmospheric pollution due to the increase in the concentration of gases other than oxygen in the air is responsible for various respiratory illnesses like, dust allergy, Cough, Cold, Noses block, Abnormal breath, Asthma, COPD[Chronic Obstructive Pulmonary Disease]. And Psychogenic [E.g. anxiety], Emotional imbalance and Excretion are the triggering factors for the Lung Function disturbances.

People prefer nowadays, treatment through natural ways like yoga all over the world. Therefore yoga has got importance in this era. Most of the diseases originate in the mind. Mind and body are closely associated according to yoga[3]. Any disturbance in the mind is expressed in the body. Mind influences different body functions if mind is not taken care of. They will result in the manifestation of various diseases in the body, if these disturbances continue to be there. These disorders are called psychosomatic

disorders because disturbance in the mind causes the somatic dysfunction[4]. Psychosomatic disorders are increasing every day. Yoga, which considers the man 'as a whole', can definitely play the vital role here. The practice of yoga directly influences the mind as well as the body. Therefore yoga can maintain healthy mind and body.[5]

Research in yoga therapy is very essential to assess and standardize the efficacy of yogic techniques in the treatment and to understand their potentiality in curing and prevention of various diseases which may be physical, mental or psychosomatic. A lot of research is undertaken in various aspects of yoga in relation to health, disease, physiological and psychological benefits of yoga. Even then more and more systematic scientific research studies have to be done with sufficient subjects and control groups to assess and standardize the efficacy of yoga therapy.[6]

Day by day the prevalence of chronic obstructive pulmonary diseases (COPD) is increasing. COPD is a common and distressing condition resulting in wheezing, coughing and a sense of suffocation. The complication of COPD increases with the duration of the disease. The body becomes weak and debilitated. In addition, defects of posture, with permanent expansion of ribcage and hunching of the shoulders, commonly accompany long standing COPD. The capacity to enjoy a fully active life and to participate in normal social and personal relationship is therefore reduced as the COPD is forced to lead an extremely sheltered life, with innumerable restrictions. By considering all the above aspects, the yogic practices will be a great tool for those who suffer from COPD, to overcome from it. By this a number of people will get a permanent way to overcome from their disease. Thus, by considering the above aspect, the current topic is put forward to have a unique work in the field of Yoga Therapy.

Objective:

To find out the impact of yoga therapy on Chronic Obstructive Pulmonary diseases (COPD)

Variables

Independent Variable: Selected Yogic practices

Dependent Variable : FVC, FEV_1, FEV1/FVC, Lung age, TLC, ESR, Bicarbonate

Hypothesis

In order to study the problem scientifically, the following Null Hypotheses were set:

1. There is no significant difference between pre and post FVC, FEV_1, PEFR and Lung age test in experimental group.
2. There is no significant difference between pre and post TLC, ESR and Bicarbonate test in experimental group.

Chapter 2

Concept of Health

This is the chapter where the concept of health is explained. The modern concept of health, Indian concept of health, causes of disease, yogic concept of health, mental health, various health concepts which are described by sage Patanjali are the key objects of this chapter.

Chapter 3

Description of COPD

This chapter deals with the modern perspective of COPD. The definitions, causes, symptoms and management through modern medicine are explained here.

COPD is defined as a preventable and treatable lung disease with some significant extra pulmonary effects that may contribute to the severity in individual patients[7].

COPD, or chronic obstructive pulmonary disease, is a progressive disease that makes it hard to breathe. "Progressive" means the disease gets worse over time[8].

COPD can cause coughing that produces large amounts of mucus (a slimy substance), wheezing, shortness of breath, chest tightness, and other symptoms. Cigarette smoking is the leading cause of COPD. Most people who have COPD smoke or used to smoke. Long-term exposure to other lung irritants—such as air pollution, chemical fumes, or dust—also may contribute to COPD.

Common signs and symptoms of COPD include:

- An ongoing cough or a cough that produces a lot of mucus (often called "smoker's cough")
- Shortness of breath, especially with physical activity
- Wheezing (a whistling or squeaky sound when one breathes)
- Chest tightness

According to modern concept, smoking cessation, Bronchodilators, Corticosteroids, Pulmonary rehabilitation, Oxygen therapy and surgical intervention are the measures of management of COPD.

Chapter 4

Yogic Management of COPD

Yoga therapy is a systematic approach to any disease or disorder through various techniques of yoga. This kind of approach will lead to the betterment of health by overcoming the disease from its cause. This particular chapter is included to show how

the limbs of yoga like lifestyle, practice of asana, pranayamas, bandha-mudras, medtation and relaxation techniques help in case of COPD. Mainly here the various practices of yoga help to strengthen the diaphragm and the intercostal muscles which are directly related to the mechanism of breathing. This type of strengthening is seen only in yoga because of its unique characteristic of breath synchronization with body movement.

Chapter 5

Review of Literature

This chapter deals with the literatures available in the respective topic. In the first part the classical literatures are discussed and in the latter the available journal publications are described. A glimpse of which is mentioned below.

Maharshi Patañjali defines yoga as 'yogah cittavrtti nirodhah'.[9] He explained various therepeutical aspects in his yoga sūtras. These can be used for curative, preventive and promotive aspects in relation to human health. He describes that the mental distraction is the root cause for disease.[10] Hathapradipika says that; As a result of performing Dhauti, asthma, diseases of the spleen and the skin and the twenty varieties of disease caused by excess of phlegm undoubtedly get cured.[11] In recent years, number of studies have been done in yoga, still many of the aspects are untouched.

Sharma K K et.al (2014)[12] in their study concluded that yogic practices have significant impact in the improvement of lung functions.

Sharma K K et.al (2014)[13] in their study concluded that yoga can work as a therapeutic tool for the disorders of the lungs

Fulambarker (2012)[14] et al showed in their study that Yoga when practiced by patients with COPD results in improvement in the QOL and lung function on a short-term basis.

Demeke Mekonnen, and Dr Andualem Mossie (2010)[15] in their study showed that Yoga exercise among asthmatic patients resulted in a decreased number of day and night attacks and use of drugs. It also shows significant improvement in the peak expiratory flow rate.

Ahmed QR et al (2010)[16] done an evaluation of pulmonary parameters in two groups of subjects during *Yoga* practice and concluded that regular practice of *Yoga* (posture and *pranayamas*) can increase the efficacy of respiratory muscles.

Chapter 6

MATERIALS AND METHODS

The actual study part makes this chapter. The methodology and the parameters used are explained here. The present research study was carried out in the Department of Human consciousness and Yogic Sciences, Mangalore University, Mangalagangothri, Karnataka, under the guidance of Dr. K. Krishna Sharma, Chairman of the Department of Human consciousness and Yogic Sciences. Objective of the study was to assess the effect of yoga therapy on the subjects of Chronic Obstructive Pulmonary Diseases (COPD). Institutional Human Ethical committee (IHEC) of Mangalore University has approved the current research work. 120 volunteer subjects with age group 25-60 years were randomly selected for the study. They were ready to cooperate as subjects of the research study and informed written consent is obtained from them. They were classified in to two groups i.e. Experimental and Control with 60 subjects each. They

were comparatively new to yogic practices. The Control group continued with normal lifestyle. The Experimental Group was offered selected yogic practices, six days per week for duration of one hour. This practical session utilized a standard sequence of selected Asanas, Pranayamas, and Relaxation Techniques, taking appropriate precautions. A Paired "Z" test was employed in the study to analyze the significance of the result statistically. The following Yogic practices taught to Experimental group for a period of 3 months followed by 3 months of follow up.

Svastikasana, Kapalabhati, Vajrasana, Supta vajrasana, Simhasana Tadasana I, Trikonasana, Parsvakonasa , Pascimottanasana, Purvothanasana, Pavanamuktasana, Bhujangasana, Shalabhasana,Dhanurasana,Ustrasana, Janusirshasana, Bharadwajasana Viparitakarani,Ujjayee, Anuloma Viloma, Bhastrika,Shavasana/Yoganidra

Parameters

1. Forced vital capacity (FVC). This measures the amount of air exhaled with force after the deep inhalation.
2. Forced expiratory volume (FEV_1). This measures the amount of air one can exhale with force in one breath. The amount of air exhaled may be measured at 1^{st} second (FEV_1).
3. Peak expiratory flow Rate (PEFR). This measures how quickly one can exhale. It is usually measured at the same time as forced vital capacity (FVC).
4. Lung Age: This is the age of lung calculated on the basis of FVC.

Blood test

The blood tests for TLC (Total White Blood Cell Count), E.S.R (Erythrocyte Sedimentation Rate), and Bicarbonate were considered as the other parameters for the study. Normal values range from 4000/ml to 11000/ml. The erythrocyte sedimentation

rate (ESR) is a common hematology test which is a non-specific measure of inflammation. ESR will be increased by any cause or focus of inflammation. Normal values for ESR are 05-15 mm/hr in male and 10-20 mm/hr in female. Bicarbonate is the measure of carbon dioxide dissolved in the blood. Normal value is 24-31mmol/L

Chapter 7

OBSERVATIONS AND RESULTS

Results of the total study are described in this chapter. This is an important chapter where the quantification of the results has been done and it is compared with control group by doing the statistical analysis. The data collected for Spirometer recordings and blood tests were analyzed using 'Z' test. The level of significance, 'p' is considered as 0.05 to decide the significance of the result. The difference is considered statistically significant if $p < 0.05$ and non significant if $p > 0.05$. The difference is considered highly significant if $p < 0.01$. It is found that an overall improvement in FVC, FEV_1, FEV1/FVC and Lung age, TLC, ESR, and Bicarbonate in Experimental group, but not such significant improvement in the Control group. This shows that functioning of Lungs and overall health has improved only in the Experimental group. Therefore, in general we can analyze the result as follows:

- As far as lung parameters are concerned, subjects of Experimental group showed remarkable improvement.
- Biochemical parameters of experimental group shown significant reduction.

The obtained values for Spirometer readings and blood tests by statistical procedures are tabulated below.

Table 1 : The Values of FVC, FEV_1, FEV1/FVC, Lung age, TLC, ESR, Bicarbonate of **Experimental Group**

Sl No.	Parameter	Mean +/- SD		Z value	P value	Significance
		PRE	POST			
1	FVC	2.473 +/- 0.2475	3.2063 +/- 0.2263	-16.9394	0	HS
2	FEV1	1.6708 +/-0.2404	2.86 +/- 0.1909	-30.0039	0	HS
3	FEV1/FVC %	68.3093 +/- 17.3028	89.227 +/- 0.9545	-9.3499	0	HS
4	PEFR	2.2326 +/- 0.3818	4.3563 +/- 0.1273	-40.87	0	HS
5	Lung Age	58.0167 +/- 4.2426	37.9167 +/- 4.9497	23.8823	0	HS
6	TLC	8521.33 +/- 707.11	6977 +/- 749.53	11.61	0	HS
7	ESR	11.82 +/- 0.1	7.63 +/- 0.1	229.13	0	HS
8	Bicarbonate	32.50+/- 1.41	26.95 +/- 2.12	16.86	0	HS

HS-Highly Significant

Table 2: The Values of FVC, FEV_1, FEV1/FVC, Lung age, TLC, ESR, and Bicarbonate of **Control Group**

Sl No.	Parameter	Mean +/- SD		Z value	P value	Significance
		PRE	POST			
1	FVC	2.364 +/- 0.4033	2.292 +/- 0.3788	1.007	0.3135	NS
2	FEV1	1.629 +/- 0.2939	1.517 +/ - 0.2764	2.1615	0.0306	NS
3	FEV1/FVC %	68.736 +/- 7.8987	66.6868 +/- 8.7758	1.3443	0.1788	NS
4	PEFR	2.043 +/- 0.4904	1.8331 +/- 0.3718	2.6406	0.0082	S*
5	Lung Age	60 +/- 12.3353	61.55 +/- 11.8410	-0.7021	0.4825	NS
6	TLC	8345.83 +/- 777.82	8355.67 +/- 692.96	-0.0731	0.9417	NS
7	ESR	11.67 +/- 4.95	12.35 +/- 2.82	-0.9284	0.3531	NS
8	Bicarbonate	30.82 +/- 4.24	31.38 +/- 3.53	-0.7947	0.4267	NS

NS: Non-Significant

*Peak Expiratory flow rate is reduced significantly over a period of six months in control group which is the indication that the disease is progressive.

Chapter 8

DISCUSSION

By considering the obtained result, it is discussed in this chapter that the positive changes in the experimental group are only because of the implementation of yogic practices. The present study reveals that the concerned variables of Lung Function Test and biochemical tests have been rationalized in terms of the hypotheses, that the Experimental group will outperform the control group due to 6 months of yogic practices. The results could best depicted that, there is significant improvement at a level of significance $p<0.01$ in all the parameters are concerned. When Compared to the Experimental group, the Control group has not shown any such significant changes after the study period. This reveals that the Experimental group has been benefited in terms of various variables are concerned. This improvement in lung function parameters (FVC, FEV_1, FEV1/FVC, PEFR and Lung Age) after the practice of yoga indicates that, yoga may be a useful form of therapy for COPD. This is further substantiated by the significantly greater improvement in quality of life in the experimental group than in the control group. It is evident from the above result that all the 60 subjects responded to the treatment positively, as the tables show the improvement. Hence it is proved that **"**Yogic practices have a significant impact in the improvement of lung functions.**"** But the variation of the rate of success could be depended on the regularity of the practice, lifestyle, dietary change and the chronicity of the disease.

The portion of the data obtained from the above study is analyzed and the two research papers published in International journals and one research paper presented in UGC sponsored International seminar. The details are as follows.

1) Ajithesha N H & Sharma K K et.al (2014), Effect of Yoga Therapy on Lung functions in Respiratory Disorder Subjects, *European Scientific Journal (E.S.J)*, Vol. No. 4, ISSN No 1857-7881, Impact Factor: 5.09.
2) Ajithesha N H & Sharma K K et. Al (2014), A Study to access the effect of yoga therapy on selected lung parameters in subjects with COPD, *International Journal of Scientific research*; Vol. 3, Issue:7, July, pp. no. 56-58, 2014, 2277-8179; 1.8651**.**
3) Ajithesha N H. (2014), International Seminar on Health Related Physical Fitness and Wellness, 23rd August 2014, Poornaprajna College, Udupi, *Role of Yoga Therapy in Improving the Lung Functions of COPD Subjects.*

Chapter 9

CONCLUSION

The study is concluded here by considering all the above chapters. That is, it is evident from the present study that the Yogic practices work efficiently to improve the functioning of lungs. Significant, steady and progressive improvement in key objective variable such as FEV_1 only in the experimental group but not in the control group indicates the efficacy of yoga. It is also visible from the above results that techniques of yoga not only helpful in attaining the mental calmness but also in gaining the proper physiological functions. This study reveals the effectiveness of yogic techniques in overcoming the chronic obstructive pulmonary diseases. Therefore it can be generalized that Yoga can work as a therapeutic tool for the disorders of the lungs. There is no doubt that persons get freshness and peace of mind after the yogic practices.

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